Prysmian Group

Marine Cable Catalogue

NORTH EUROPE

PRYSMIAN

Draka

Prysmian Group

Linking the future

As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology.

Through two renowned commercial brands - Prysmian and Draka - based in almost 50 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures and achieve sustainable and profitable growth.

For our energy business, we design, produce, distribute and install cables and systems for the transmission and distribution of power at low, medium, high and extra-high voltage.

For telecoms, the Group is a leading manufacturer of all types of copper and fibre cables, systems and accessories for voice, video and data transmission.

Drawing on over 130 years' experience and continuously investing in R&D, we apply excellence, understanding and integrity to everything we do, meeting and exceeding the needs of our customers across all continents - while at the same time shaping the evolution of our industry.

Linking global expertise to the wheels of industry

On every continent, in applications that range from air and rail transport infrastructure to heavy duty industries such as mining, tunnel drilling and defence, Prysmian's specialist cable solutions sit at the heart of significant international projects; supporting the work of major customers, with high-performing, durable and safe technology.

As the world leader in cabling, we draw on global expertise and local presence to work in close proximity with our customers, delivering products and service platforms, built on easy contact, customized solutions and effective supply chains, meeting their specialized requirements, to help them drive the wheels of industry and achieve sustainable growth and profitability. As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

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Marine Cables

Marine cables (ship wiring and ship board cables) are for installation on board ships. They have been type approved by a classification society and they have a construction that adheres to standards for marine cables, such as: They are based on an amount of 7 litres of combustible material per metre. Bunched cables have to be minimum 3.5 meters tall, when they are in a test chamber subjected to fire from a burner directed at the cables for 40 minutes. The bunched cables may not burn more than 2.5 meters above the burner. See figure 2. on page 6.

Conductor

Marine cable conductors are made with stranded annealed copper, combining flexibility and small dimensions to provide excellent handling. To minimise the cable diameter and weight sector shaped conductors are used for bigger cross-section.

Fire Resistance

These tests are aimed at verifying the behaviour of a cable´s circuit integrity during fire. The main three test methods are IEC 60331-21, IEC 60331-1 and IEC 60331-2, the latter is used for power and control cables. Marine cable standards require a IEC 60331-21 test, where the cable is exposed to a flame at 750°C for 90 minutes followed by a 15 minutes cooling period, while the rated voltage is being applied. No breakdown or short circuit is permitted during the test. See figure 3. on page 6.

The optional test methods for cables with diameters over 20 mm, is the more rigorous IEC 60331-1 test. For cable diameter not exceeding 20 mm test IEC 60331-2 can also be used, in which a bent cable, affected by mechanical shock, is subjected to a 830°C flame for minimum 90 minutes.

Insulation Material

XLPE is used as the main insulation material. It withstands higher temperatures than ordinary thermoplastic polyethylene. It is resistant against deformation and various chemicals, with excellent mechanical and electrical properties. The maximum conductor temperature stipulated by IEC 60092-360 marine cable standard is 90°C.

Sheathing Material

The sheath is composed of halogen free, flame retardant thermoplastic compound. It fulfils the criterion of SHF1 according to IEC 60092-360. In case of fire the sheathing material offers advantages such as reduced emission of smoke and corrosive toxic gasses.

Smoke Density

Smoke density is tested according to IEC 61034-1 (apparatus) and IEC 61034-2 (procedure and requirements). It is done by placing a cable in a ”smoke cube” (3x3x3 m). When the cable is burning, the light transmittance is measured using a photometric system. 60% (70% for a single cable) visibility is satisfactory if it is attained throughout the test.

Halogens

To test whether a material is halogen free or not, test IEC 60754-1 and 60754-2 are used. The acidity of the gasses from burning materials is measured. Halogen-free means that the materials used in the cable do not contain any halogens – such as chlorine, bromine, iodine or fluorine. In order to attain a self-extinguishing effect that halogens have in cables, ATH (aluminium trihydroxide) based materials are used instead. This way the negative effects of halogens are avoided.

Vertical flame propagation test

IEC 60332-1-2

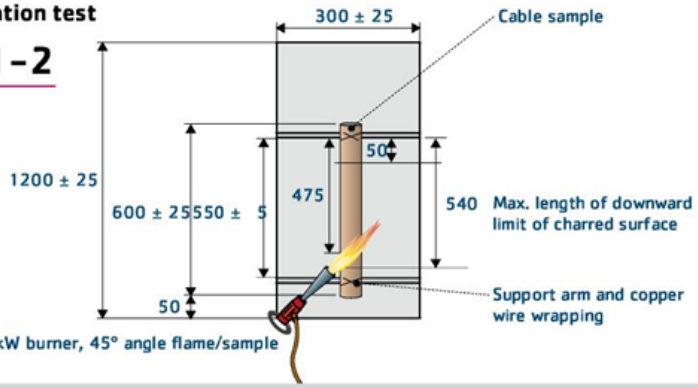

Figure 1.

Vertical flame spread of bunched cables

IEC 60332-3-22 cat.A

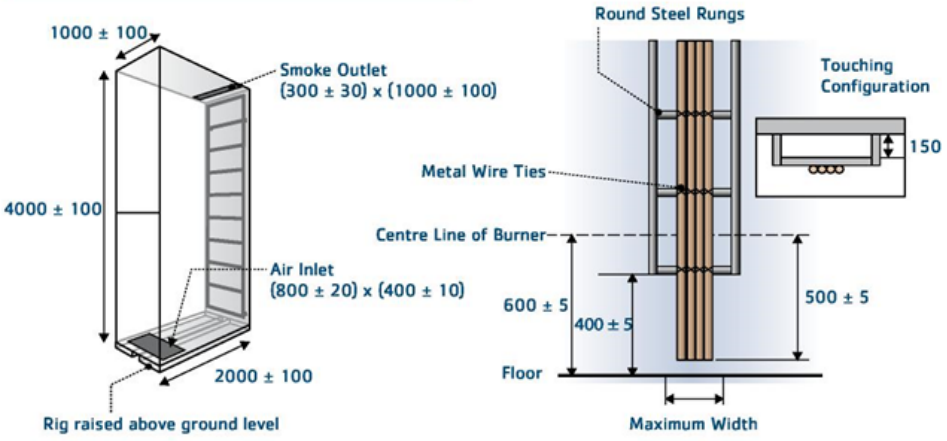

Figure 2.

Fire resistance test

IEC 60331-21

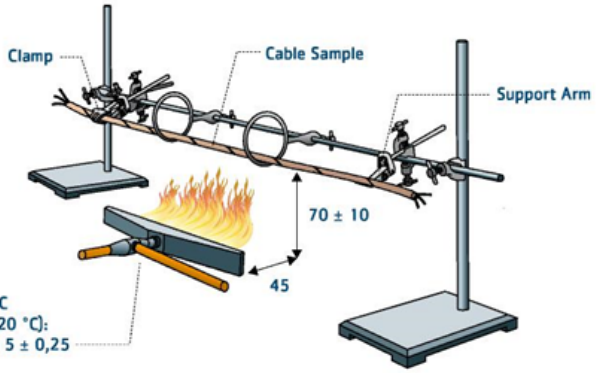

Figure 3.

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Fire Testing Methods

Flame retardance of a single cable is tested in accordance with IEC 60332-1-2. It is performed on a 60 cm cable sample with a gas flame for 1-8 minutes depending on the cable diameter. The cable has to be self-extinguishing up to a certain limit to fulfil the test. Flame spread is tested on bunched cables in accordance with IEC 60332-3-22, which simulating the fire behaviour of cables installed in a bunch. The main category used is type A.

Test Methods

IEC 60331-1 & 2 for fire with shock at a temperature of at least 830°C. Bunched cables are tested for flame spread.

Quality Control

Each manufactured cable goes through a test procedure according to the IEC 60092-300 series standards.

Explanation of symbols

Conductor temperature
Max. conductor temperature °C in continuous operation.

Screened or armoured
With either copper, aluminum or steel wire, foil and tape.

Oil resistant
Acc. to DIN EN 60811-404

Weather proof

Fire resistant
Fire resistant acc. to EN/IEC 60331-1 & 2.

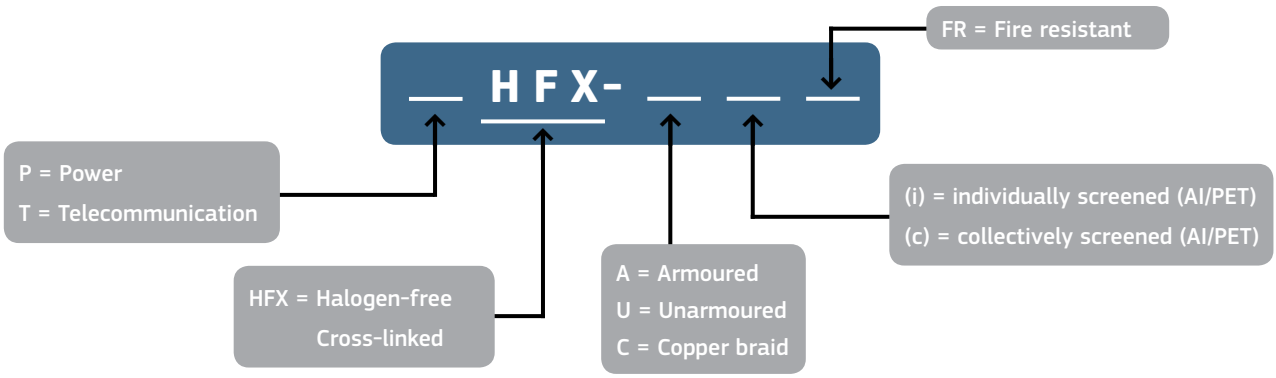
Fire retardant
Flame propagation acc. to EN/IEC 60332-1.
Bundled and vertical acc. to EN/IEC 60332-3.

Halogen free
Halogen free acc. to EN/IEC 60754-1 and EN/IEC 50267-1.

Acidity
Corrosivity acc. to EN/IEC 60754-2.

Smoke density
Smoke propagation acc. to EN/IEC 61034.

Type designations



Marine Approvals

As a manufacturer we must be able to prove to our customers in the maritime industry, that our cables comply with rules and regulations pertaining to the particular type of cable and its application purpose on vessels.

Prysmian Group uses a variety of recogniced and accredited third-party organisations to test and certifify our cables - to ensure the highest lavel of safety and quality for our customers.

Den Norske Veritas and Germanischer Lloyds (DNV-GL)

Norske Veritas (DNV) founded in Olso, Norway in 1864 and Germanischer Lloyd (GL) established in Hamburg Germany in 1867 was merged in 2013 and today it is a globally leading quality assurance and risk management company. DNV- GL offer technical services such as design assessment, type approvals, third-party inspection, verification and testing. Including certification of materials, components and systems relevant to the safe operation and quality of ships and offshore installations.

Bureau Veritas (BV)

Created in 1828, Bureau Veritas is a global leader in Testing, Inspection and Certification (TIC), delivering high quality services to help manufactors meet the growing challenges of quality, safety, environmental protection and social responsibility.

Bureau Veritas is an accredited EU recognised organisation allowed to provide EU Mutual Recognition Type Approval services according to certification, described in rule notes NR 320 and NR 266.

Russian Maritime Register of Shipping (RMRS)

The classification society Russian Maritime Register of Shipping (RS) was established in 1913 and has been a member of IACS since 1969. Today RS is recognized by the European Union and in compliance with EC Regulation 391/2009. As well as certified by QACE. RMRS offers technical design assessment, surveys and issuing of documents, certificates and reports to ships and offshore installations as well as for ship logistics, machinery, equipment, products and materials.

Lloyds Register
(LR)

LR is a leading international provider of classification, compliance and consultancy services to the marine and offshore industries, helping our clients design, construct and operate their assets to the highest levels of safety and performance.

Manufacturers whose products will be used on board a vessel classed with Lloyd's Register must get their products certified to meet the LR Marine & Offshore Rules.

Classification with Lloyd's Register means adding value to our products. This helps merchants manage their ships and offshore assets to their full potential, maintain operational effectiveness and minimise risk to life, property and the environment.

The Italien Naval Register
(RINA)

The Italian Naval Register abbreviated RINA or RINa was established in Genoa, Italy in June 1861, and after various changes of denomination and tasks assumed the current title in 1938. It is a private law foundation operating mainly in the classification of ships, confirming that a ship has been designed and constructed in compliance with the regulations and criteria , and is therefore authorized to activity for which it was conceived.

American Bureau of Shipping
(ABS)

The American Bureau of Shipping (ABS) is a classification society, with a mission to promote the security of life, property and the natural environment, primarily through the development and verification of standards for the design, construction and operational maintenance of marine-related facilities.

Prysmian Group

PRODUCTS

POWER & CONTROL CABLES UP TO 3 KV

Unarmoured 0.6/1 (1.2) kV

PHFX-U (LM-HF) 12

Armoured 0.6/1 kV

PHFX-A (LSM-HF) 16

Armoured 1.8/3 (3.6) kV

PHFX-A (LSM-HF) 20

INSTRUMENTATION & COMMUNICATION CABLES UP TO 300 V

Screened 150/250 (300) V

THFX-U(c) (LJT-HF) 22

Armoured 150/250 (300) V

THFX-C (LJST-HF) 24

Individually screened 250 V

HFX-ISOSA/CU 26

Bus cable 100 V

SIENOPYR-FR PROFIBUS M-02Y(ST)CHX 28

FIRE RESISTANT CABLES UP TO 1 kV

Unarmoured Power & Control 0.6/1 (1.2) KV

PHFX-UFR (LM-FRHF) 30

Armoured Power & Control 0.6/1 (1.2) kV

PHFX-AFR (LSM-FRHF) 32

Armoured 150/250 (300) V
Instrumentation, Communication & Control

SIENOPYR-FR FMHXCH FE 120 34

MEDIUM VOLTAGE CABLES UP TO 24 KV

Armoured 6/10 (12) kV

MV-FHFX/A 36

Armoured 12/20 (24) kV

MV-FHFX/A 38

TECHNICAL DATA

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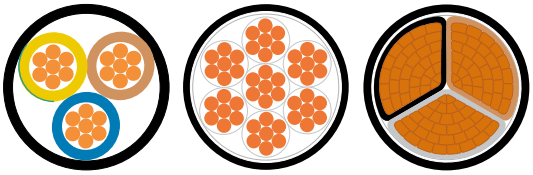
Electrical data 44

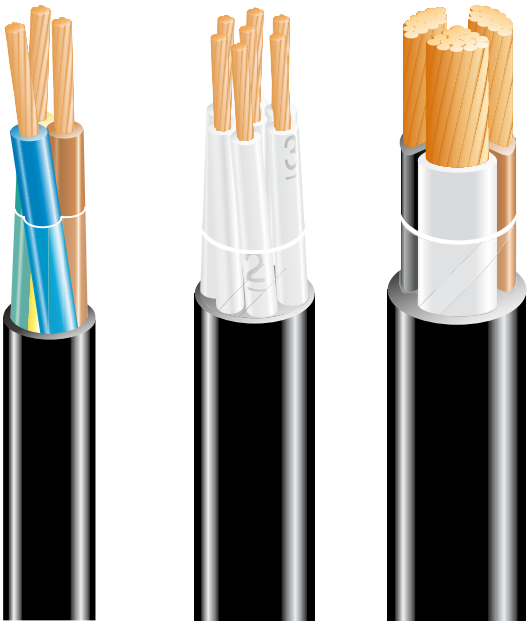
PHFX-U

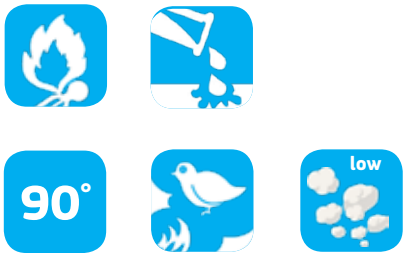
LM-HF

0,6/1 (1,2) kV UNARMOURED POWER & CONTROL CABLE

For fixed installation in power, lighting and control circuits on sea vessels and offshore platforms.







Conductor

Annealed stranded plain copper, class 2.
> Round in single core from 16 to 300
> Round in multicore from 1,5 to 25 mm²
> Sector shaped in multicore from 35 to 240 mm²
> Conductor is compacted when ≥ 25 mm²

Conductor

Fine stranded plain copper, class 5.
> Round in single core from 25 to 300 mm²
> Round in multicore from 35 to 185 mm²

Insulation

Extruded XLPE
> See page 41 for core identification colours

Sheath

Extruded black halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards

IEC 60092-353 and IEC 60092-350
> Materials
IEC 60228 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals

> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> BV Certificate no. 06580/E0
> RMRS (Russian Maritime Registration of Shipping)

Properties

Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-353
Choice and Installation
> Acc. to IEC 60092-352

Temperature

Maximum conductor temperature
> +90°C

Pulling force

Maximum per conductor
> 50 N / mm²

Conductor Cross-section mm	Including earth wire	Conductor height mm	Conductor width mm	Cable diameter mm	Cable weight kg/km	Bending radius fixed mm
POWER CABLES						
1 x 16		5,0	–	9,0	200	75
1 x 25		5,8	–	10,5	300	85
1 x 35		6,9	–	11,5	405	95
1 x 50		7,9	–	13,0	530	110
1 x 70		9,6	–	15,5	745	130
1 x 95		11,3	–	17,0	1000	140
1 x 120		12,7	–	19,0	1260	155
1 x 150		14,1	–	21,0	1550	170
1 x 185		15,7	–	23,5	1910	190
1 x 240		18,1	–	26,0	2490	210
1 x 300		20,2	–	29,0	3090	235
2 x 1,5		1,6	–	8,5	90	35
2 x 2,5		2,0	–	9,5	120	40
2 x 4		2,6	–	10,5	165	45
2 x 6		3,1	–	12,0	210	50
3 x 1,5	3G1,5	1,6	–	9,0	105	40
3 x 2,5	3G2,5	2,0	–	10,0	145	40
3 x 4	3G4	2,6	–	11,5	205	50
3 x 6	3G6	3,1	–	12,5	260	50
3 x 10		4,0	–	15,0	430	60
3 x 16		5,0	–	17,5	635	70
3 x 25		5,8	–	20,5	955	85
3 x 35		5,6	9,2	21,0	1220	170
3 x 50		6,5	10,7	24,0	1610	195
3 x 70		7,9	12,8	28,0	2230	230
3 x 95		9,3	15,1	32,0	3035	260
3 x 120		10,5	17,0	35,0	3790	280
3 x 150		11,6	18,9	39,0	4670	320
3 x 185		13,1	21,1	43,5	5810	350
3 x 240		15,0	24,4	49,0	7580	395
3 x 300		16,8	27,2	53,5	9410	430
4 x 1,5	4G1,5	1,6	–	9,8	130	40
4 x 2,5	4G2,5	2,0	–	11,0	180	45
4 x 4	4G4	2,6	–	12,5	260	50
4 x 6	4G6	3,1	–	14,0	350	60
4 x 10	4G10	4,0	–	16,5	545	70
4 x 16	4G16	5,0	–	19,5	820	80
4 x 25	4G25	5,8	–	23,0	1240	95
4 x 35	4G35	6,2	8,6	23,5	1610	190
4 x 50	4G50	7,2	9,9	27,5	2120	220
4 x 70	4G70	8,6	12,0	32,0	2960	260
4 x 95	4G95	10,2	14,1	36,0	4000	290
4 x 120	4G120	11,5	15,8	40,0	5010	320
–	5G1,5	1,6	–	11,0	165	45
–	5G2,5	2,0	–	12,0	220	50
–	5G6	3,1	–	15,5	440	65
–	5G10	4,0	–	18,0	660	75
–	5G16	5,0	–	21,0	1000	85
–	5G25	5,8	–	25,5	1530	155

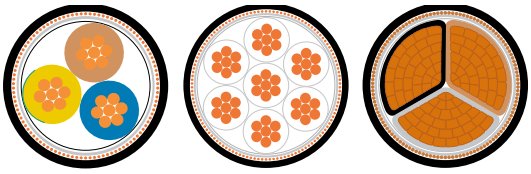
Conductor Cross-section mm	Earth wire version	Conductor height mm	Conductor width mm	Cable diameter mm	Cable weight kg/km	Bending radius fixed mm
CONTROL CABLES						
7 x 1,5		1,6	–	12,0	200	50
12 x 1,5		1,6	–	16,0	330	65
19 x 1,5		1,6	–	18,5	490	75
27 x 1,5		1,6	–	22,5	680	90
7 x 2,5		2,0	–	13,5	280	55
12 x 2,5		2,0	–	18,0	460	75
19 x 2,5		2,0	–	21,0	690	85
CLASS 5 CONDUCTOR (F)						
1 x 25		6,5	–	11,5	295	50
1 x 35		7,6	–	12,5	390	75
1 x 50		9,2	–	14,5	550	90
1 x 70		11,0	–	17,0	770	105
1 x 95		13,5	–	19,5	990	120
1 x 120		14,9	–	21,5	1250	130
1 x 150		17,2	–	24,5	1560	150
1 x 185		17,9	–	25,5	1850	160
1 x 240		20,6	–	29,0	2440	180
1 x 300		24,0	–	33,0	3070	200
3 x 35		7,6	–	27,0	1570	170
3 x 50		9,2	–	31,5	2150	190
3 x 70		11,0	–	37,0	3040	230
3 x 95		13,5	–	42,5	3930	260
3 x 120		14,9	–	46,5	4900	280
3 x 150		17,2	–	53,5	6190	330
3 x 185		17,9	–	56,0	7290	340
4 x 35		7,6	–	30,5	1960	190
4 x 50		9,14	–	33,0	2430	200
4 x 70		11,0	–	41,0	3820	250
4 x 95		13,5	–	48,0	5000	290
4 x 120		14,9	–	52,5	6260	320
4 x 150		17,2	–	59,5	7840	360
4 x 185		17,9	–	63,0	9240	380
–	5G35	7,6	–	32,5	2420	200
–	5G50	9,2	–	39,5	3360	240
–	5G70	11,0	–	45,5	4690	280
–	5G95	13,5	–	53,0	6140	320

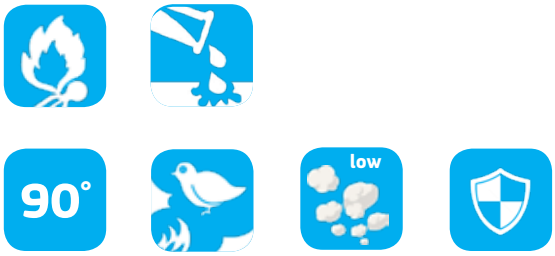
PHFX-A

LSM-HF

0,6/1 (1,2) kV ARMOURED POWER & CONTROL CABLE

For fixed installation in power, lighting and control circuits on sea vessels and offshore platforms.





Conductor

Annealed stranded plain copper, class 2.
> Round in single core from 16 to 300
> Round in multicore from 1,5 to 25 mm²
> Sector shaped in multicore from 35 to 240 mm²
> Conductor is compacted when ≥25 mm²

Conductor

Fine stranded plain copper, class 5.
> Round in single core from 35 to 300 mm²
> Round in multicore from 35 to 185 mm²

Insulation

Extruded XLPE
> See page 41 for core identification colours

Armour

Braided of copper wires

Sheath

Extruded black halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards

IEC 60092-353 and IEC 60092-350
> Materials
IEC 60228 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals

> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> BV Certificate no. 07025/E0
> RMRS (Russian Maritime Registration of Shipping)

Properties

Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-353
Choice and Installation
> Acc. to IEC 60092-352

Temperature

Maximum conductor temperature
> +90°C

Pulling force

Maximum per conductor
> 50 N / mm²

Conductor cross-section mm	Earth wire version	Conductor height mm	Conductor width mm	Diameter over braid mm	Cable diameter mm	Cable weight kg/km	Bending radius, fixed mm
POWER CABLES							
1 x 16		5,1	–	7,7	10,5	255	65
1 x 25		5,8	–	9,0	11,5	360	70
1 x 35		6,9	–	10,5	13,0	475	80
1 x 50		7,9	–	11,5	14,5	595	90
1 x 70		9,6	–	14,0	17,0	860	105
1 x 95		11,3	–	16,0	19,0	1135	120
1 x 120		12,7	–	17,5	21,0	1400	130
1 x 150		14,1	–	19,5	23,0	1700	140
1 x 185		15,7	–	21,5	25,0	2095	150
1 x 240		18,1	–	24,0	28,0	2650	170
1 x 300		20,2	–	26,5	30,5	3320	185
2 x 1,5		1,6	–	7,5	10,0	130	60
2 x 2,5		2,0	–	8,5	11,0	160	70
2 x 4		2,6	–	9,5	11,5	200	70
2 x6		3,1		10,5	13,0	255	80
3 x 1,5	3G1,5	1,6	–	8,0	10,0	150	60
3 x 2,5	3G2,5	2,0	–	9,0	11,5	195	70
3 x 4		2,6	–	10,0	13,0	270	80
3 x 6		3,1	–	11,0	14,0	320	85
3 x 10		4,0	–	13,5	16,5	520	100
3 x 16		5,0	–	16,0	19,0	740	115
3 x 25		5,8	–	18,5	22,0	1050	135
3 x 35		5,6	9,2	19,0	23,0	1350	185
3 x 50		6,5	10,7	21,5	25,5	1750	205
3 x 70		7,9	12,8	25,0	29,0	2400	235
3 x 95		9,3	15,1	28,0	33,0	3200	265
3 x 120		10,5	17,0	31,5	36,5	4100	295
3 x 150		11,6	18,9	35,0	41,0	5000	330
3 x 185		13,1	21,1	39,5	45,5	6350	365
4 x 1,5	4G1,5	1,6	–	8,5	11,0	180	70
4 x2,5	4G2,5	2,0	–	10,0	12,5	250	75
4 x 4	4G4	2,6	–	11,5	14,0	320	85
4 x 6	4G6	3,1	–	13,0	16,0	450	100
4 x 10	4G10	4,0	–	15,5	18,5	670	115
4 x 16	4G16	5,0	–	17,5	21,0	940	130
4 x 25	4G25	5,8	–	20,5	24,0	1350	145
4 x 35	4G35	6,2	8,6	21,5	25,5	1750	205
4 x 50	4G50	7,2	9,9	24,5	29,0	2300	235
4 x 70	4G70	8,6	12,0	28,0	33,0	3200	265
4 x 95	4G95	10,2	14,1	32,0	37,0	4300	300
4 x 120	4G120	11,5	15,8	36,0	41,0	5300	330
5 x 1,5	5G1,5	1,6	–	9,5	12,0	220	75
5 x 2,5	5G2,5	2,0	–	11,0	13,5	290	85

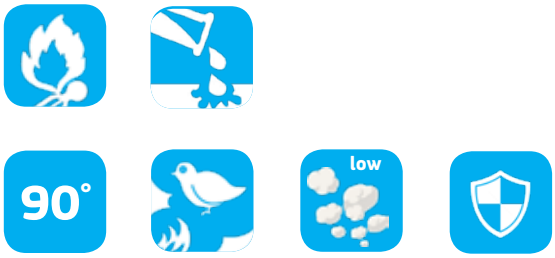
Conductor cross-section mm	Earth wire version	Conductor height mm	Conductor width mm	Diameter over braid mm	Cable diameter mm	Cable weight kg/km	Bending radius, fixed mm
CONTROL CABLES							
7 x 1,5		1,6	–	10,5	13,0	270	80
12 x 1,5		1,6	–	14,5	17,0	460	105
19 x 1,5		1,6	–	17,0	20,0	640	120
27 x 1,5		1,6	–	21,0	24,5	870	150
7 x 2,5		2,0	–	12,0	14,5	330	90
12 x 2,5		2,0	–	16,5	20,0	620	120
19 x 2,5		2,0	–	19,5	23,0	900	140
CLASS 5 CONDUCTOR (F)							
1 x 35		7,6		11,0	14,0	470	85
1 x 50		9,9	–	15,0	17,5	700	105
1 x 70		11,0	–	17,0	19,0	920	115
1 x 95		13,5	–	19,0	21,0	1170	125
1 x 120		15,2	–	21,0	23,5	1450	140
1 x 150		17,2	–	24,0	26,0	1550	155
1 x 185		18,9	–	26,0	28,5	1770	170
1 x 240		21,8	–	30,0	32,0	2700	190
3 x 35		7,6	–	25,0	29,0	1800	180
3 x 50		9,2	–	29,0	33,0	2400	200
3 x 70		11,0	–	34,0	38,5	3360	235
3 x 95		13,5	–	40,0	45,0	4390	270
3 x 120		14,9	–	43,5	48,5	5390	295
3 x 150		17,2	–	50,0	55,5	6760	335
3 x 185		17,9	–	52,5	58,0	7860	350
4 x 35		7,6	–	27,5	31,5	2190	190
4 x 50		9,2	–	32,0	36,0	2970	220
4 x 70		11,0	–	38,5	43,0	4280	260
4 x 95		13,5	–	44,5	50,0	5510	300
4 x 120		14,9	–	49,0	54,5	6850	330
4 x 150		17,2	–	55,5	61,5	8488	370
4 x 185		17,9	–	58,5	65,0	10040	390
–	5G35	7,6	–	30,5	34,5	2690	210
–	5G50	9,2	–	35,5	40,0	3660	240
–	5G70	11,0	–	42,5	47,5	5210	285
–	5G95	14,5	–	50,0	55,0	6730	330

PHFX-A

LSM-HF

1,8/3 (3,6) kV ARMOURED POWER & CONTROL CABLE

For fixed installation on sea vessels and offshore platforms. Suitable for variable frequency drives.



Conductor

Annealed stranded plain copper
> Compacted class 2.
> Fiine stranded class 5.

Insulation

Extruded XLPE
> Plastic coated tape for 3-core cables
> See page 41 for core identification colours

Armour

Braided of copper wires

Inner sheath

Extruded halogen free polyolefine
> For 3-core cables

Sheath

Extruded red halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards

IEC 60092-353 and IEC 60092-350
> Materials
IEC 60228 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approval

> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)

Properties

Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-353
Choice and Installation
> Acc. to IEC 60092-352

Temperature

Maximum conductor temperature
> +90°C

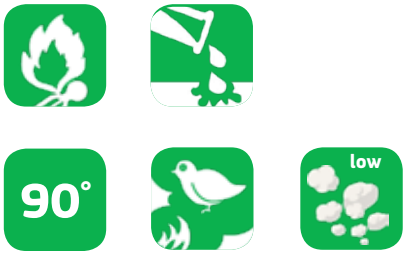
Conductor cross-section mm	Conductor diameter mm	Diameter over braid mm	Cable diameter mm	Cable weight kg/km	Bending radius, fixed mm
TEMAR PHFX-A 3 kV EMC					
3 x 50/235	7,9	33	37	2900	340
3 x 70/35	9,6	37	42	3840	380
3 x 95/35	11,3	40	46	4880	420
3 x 120/40	12,7	44	50	5920	450
3 x 150/40	14,1	47	53	7000	480
TEMAR PHFX-A F 3 kV ECM (CLASS 5.)					
3 x 95/35	13,5	46	51	5100	460
3 x 120/40	15,0	49	55	6170	500

THFX-U(c)

LJT-HF

150/250 (300) V SCREENED INSTRUMENTATION & TELECOMMUNICATION CABLE

For fixed installation in instrumentation, control and communication circuits on sea vessels and offshore platforms.



Conductor

Annealed stranded plain copper, class 2.

Insulation

Extruded XLPE

> See page 41 for core identification colours

Pair

White and blue cores are twisted to pair

> See page 31 for core identification colours

Common screen

Plastic coated aluminium tape

> Tinned copper drain wire

> Coverage 100%

Sheath

Extruded grey halogen free polyolefine, SHF1

> Installation information and electrical data on pages 42-43

Standards

IEC 60092-376 and IEC 60092-350

> Materials

IEC 60228 and IEC 60092-376 (conductor)

IEC 60092-360 (insulation)

IEC 60092-360 (sheath)

Approvals

> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)

> BV Certificate no. 07027/E0

> RMRS (Russian Maritime Registration of Shipping)

Properties

Flame Retardance

> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2

Halogen Free

> Acc. to IEC 60754-1 and -2

Low Smoke Emission

> Acc. to IEC 61034-1 and -2

Tests

> Acc. to IEC 60092-376

Choice and Installation

> Acc. to IEC 60092-352

Temperature

Maximum conductor temperature

> +90°C

Conductor cross-section mm²	Conductor diameter mm	Cable diameter mm	Cable weight kg/km	Bending radius mm
1 x 2 x 0,5	0,9	6,5	45	55
2 x 2 x 0,5 (quad)	0,9	7,5	65	60
4 x 2 x 0,5	0,9	11,0	115	90
7 x 2 x 0,5	0,9	12,0	160	100
8 x 2 x 0,5	0,9	13,5	180	110
10 x 2 x 0,5	0,9	15,5	220	125
14 x 2 x 0,5	0,9	16,5	285	135
19 x 2 x 0,5	0,9	18,5	360	150
24 x 2 x 0,5	0,9	22,0	500	185
1 x 2 x 0,75	1,1	7,0	55	60
2 x 2 x 0,75 (quad)	1,1	8,0	85	70
4 x 2 x 0,75	1,1	12,5	150	100
7 x 2 x 0,75	1,1	14,0	225	115
8 x 2 x 0,75	1,1	15,5	260	125
10 x 2 x 0,75	1,1	18,0	315	145
14 x 2 x 0,75	1,1	19,0	405	155
19 x 2 x 0,75	1,1	21,5	530	175
24 x 2 x 0,75	1,1	24,5	690	200

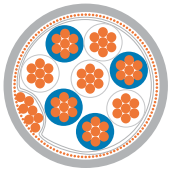
Conductor cross-section mm	Conductor resistance at 20°C ohm/km	Insulation resistance ohm/km	Mutual capacitance nF/km (multi-pair)	Loop inductance mH/km
ELECTRICAL DATA				
n x 2 x0,50	40,4	1030	45	0,7
n x 2 x 0,75	26,0	1020	50	0,7

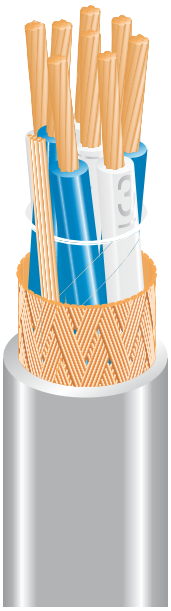
THFX-C

LJST-HF

150/250 (300) V ARMOURED INSTRUMENTATION & TELECOMMUNICATION CABLE

For fixed installation in instrumentation, control and communication circuits on sea vessels and offshore platforms.





Conductor
Annealed stranded plain copper, class 2.

Insulation
Extruded XLPE
> See page 31 for core identification colours

Pair
White and blue cores are twisted to pair
> See page 41 for core identification colours

Armour (Common screen)
Combined electrical and mechanical protection
> Braid of copper wires
> Drain wire

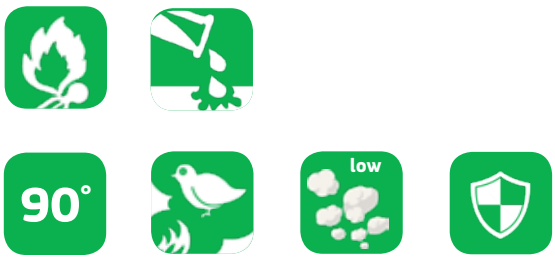
Sheath
Extruded grey halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards
IEC 60092-376 and IEC 60092-350
> Materials
IEC 60228 and IEC 60092-376 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals
> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> BV Certificate no. 07027/E0
> RMRS (Russian Maritime Registration of Shipping)

Properties
Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-376

Temperature
Maximum conductor temperature
> +90°C



Conductor cross-section mm^2	Conductor diameter mm	Cable diameter mm	Cable weight kg/km	Bending radius mm
1 x 2 x 0,5	0,9	7,5	75	45
2 x 2 x 0,5 (quad)	0,9	8,5	100	50
4 x 2 x 0,5	0,9	12,0	190	75
7 x 2 x 0,5	0,9	13,0	230	80
8 x 2 x 0,5	0,9	15,0	270	90
10 x 2 x 0,5	0,9	17,0	375	105
14 x 2 x 0,5	0,9	18,0	440	110
19 x 2 x 0,5	0,9	20,0	540	120
24 x 2 x 0,5	0,9	24,0	680	145
1 x 2 x 0,75	1,1	8,0	85	50
2 x 2 x 0,75 (quad)	1,1	9,0	120	55
4 x 2 x 0,75	1,1	13,0	220	80
7 x 2 x 0,75	1,1	15,5	345	95
8 x 2 x 0,75	1,1	16,5	390	100
10 x 2 x 0,75	1,1	19,0	475	115
14 x 2 x 0,75	1,1	20,5	580	125
19 x 2 x 0,75	1,1	22,5	715	135
24 x 2 x 0,75	1,1	26,0	880	160

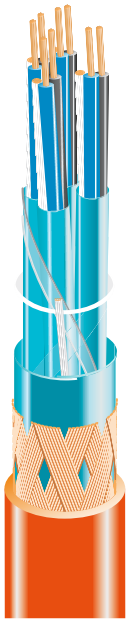
Conductor cross-section mm	Conductor resistance at 20°C ohm/km	Insulation resistance ohm/km	Mutual capacitance nF/km (multi-pair)	Loop inductance mH/km
ELECTRICAL DATA				
n x 2 x0,50	40,4	1030	45	0,7
n x 2 x 0,75	26,0	1020	50	0,7

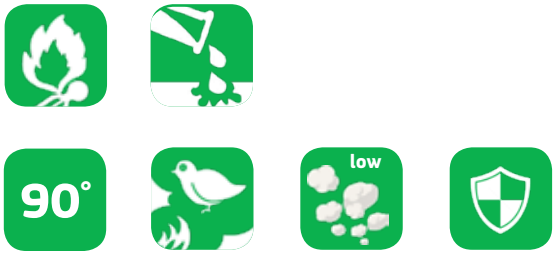
HFX-ISOSA/Cu

INDIVIDUALLY & COLLECTIVELY SCREENED

250 V
ARMOURED & SCREENED INSTRUMENTATION & TELECOMMUNICATION CABLE

For fixed installation in instrumentation, control and communication circuits on sea vessels and offshore platforms.





Conductor
Annealed stranded plain copper, class 2.

Insulation
Extruded XLPE

Pair
White and blue corse are twisted to pair
> See page 41 for core identification colours

Individual screen
Combined electro mechanical protection
> Plastic coated aluminium tape
> Tinned copper drain wire

Common screen
Plastic coated aluminium tape
> Tinned copper drain wire, coverage 100%

Armour
Braid of copper wires

Sheath
Extruded grey halogen free polyolefine, SHF1
> Installation info. and electrical data on page 42-43

Standards
IEC 60092-350 and -376
> Materials
IEC 60228 and IEC 60092-376 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals
> ABS (American Bureau of Shipping)
> RINA (Italien Naval Register)
> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> BV (Bureau Veritas)
> LR - Lloyds Register
> RMRS (Russian Maritime Registration of Shipping)

Properties
Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-376
Choice and Installation
> Acc. to IEC 60092-352

Temperature
Maximum conductor temperature
> +90°C

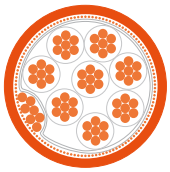
Conductor cross-section mm^2	Conductor resistance ohm/km	Conductor diameter mm	Cable diameter mm	Cable weight kg/km	Bending radius mm
2 x 2 x 0,75	26	1,1	13,6	170	109
4 x 2 x 0,75	26	1,1	17,0	300	136
7 x 2 x 0,75	26	1,1	20,1	420	161
10 x 2 x 0,75	26	1,1	24,9	630	199
14 x 2 x 0,75	26	1,1	27,1	760	217
19 x 2 x 0,75	26	1,1	30,1	1000	241
24 x 2 x 0,75	26	1,1	34,1	1190	273

SIENOPYR-FR PROFIBUS

M-02Y(ST)CHX

100 V
BUS CABLE
INSTRUMENTATION CABLE

For fixed installation in field bus networks on sea vessels and offshore platforms.



Conductor
7 bare copper wires
> E-Cu58 F21 acc. to DIN 40500 part 4
> Cross section 0,35 mm²
> AWG 22 = 0,325 mm²

Insulation
Polyethylene foam (cellular HDPE)

Core identification
> Aa core: red
> B core: green

Laying
Laying of the copper cores with two blind cores

Core assembly wrapping
Non-woven plastic textile band

Multi-layer screen
1. Layer: Laminated aluminium foil
2. Layer: Tinned copper wire braid

Inner sheath
Acc. to VDE 0207 part 24
> Halogen free poplymer (HM4)
> Nominal diameter 8 mm

Outer sheath
Acc. to IEC 60092-359
> Halogen free cross-linked polymer
> Black

Approvals
> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> LR - Lloyds Register
> BV Certificate no. 07027/E0
> RMRS (Russian Maritime Registration of Shipping)

Properties
Flame Retardance
> Acc. IEC 60332-3-24 (cat C)
Corrosivity
> Acc. to IEC 60754-2
Low Smoke Emission
> Acc. to IEC 61034
Ozone
> Acc. to DIN VDE 0472 part 805, test B
Resistance to chemicals (Test VG 95218 part 2)
> Diesel fuel, oils, hydraulic fluids
> Solvent cleaning agents
> De-ionozed water with 3,5 % NaCl

Temperature
Maximum conductor temperature
> +80°C

Transmission characteristics

Voltage
> 100 V

Conductor resisitance
> At 1 km loop at 20˚C
> Max. 110 W/km

Characteristic impedance
> At 3 to 20 MHz 150 ± 15 W
> At 38,4 kHz 185 ± 18,5 W
> At 9,6 kHz 250 ± 25 W

Wave attenuation
> At 16 MHz max. 45 dB/km
> At 4 MHz max. 22 dB/km
> At 38,4 kHz max. 5 dB/km
> At 9,6 kHz max. 3 dB/km

Mutual capacitance
> At 800 Hz
> Max. 30 nF/km

Insulation resistance
> At 20˚C
> Minimum 16.000 MWkm

Outer sheath surface resistance
> Minimum 109 W

Other properties

Temperature
> As fixed bus cable
> In installation from –35 to 80˚C
> During installation from –15 to 50˚C
> Conductor temperature in operation max. 80˚C

Tensile load
> During instalaltion: Maximum 100 N

Bending radius
> Single bending minimum 10 x D
> Flexing minimum 20 x D

Weight
> Appr. 110 kg/km

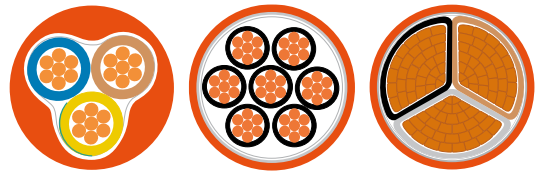
Outer diameter
> Maximum 9,8 mm

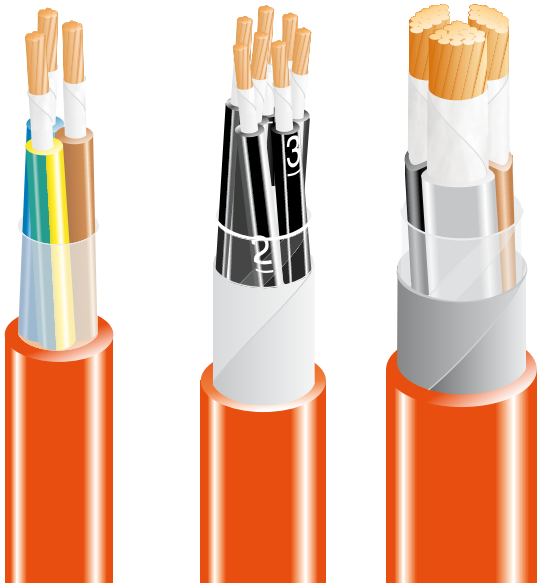
PHFX-UFR

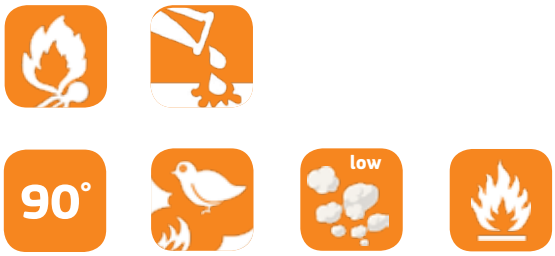
LM-FRHF

0,6/1 (1,2) kV UNARMOURED, FIRE RESISTANT POWER & CONTROL CABLE

For fixed installation in power, lighting and control circuits on sea vessels and offshore platforms.







Conductor

Annealed stranded plain copper, class 2.
> Round in multicore from 1,5 to 35 mm²
> Sector shaped in multicore from 50 to 185 mm²
> Conductor is compacted when ≥25 mm²

Insulation

Layer of fire resistant mica-tape, with overlap
> Extruded HF 90°C
> See page 41 for core identification colours

Sheath

Extruded orange halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards

IEC 60092-353 and IEC 60092-350
> Materials
IEC 60228 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals

> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> BV Certificate no. 23758/B0
> RMRS (Russian Maritime Registration of Shipping)

Properties

Fire resistant
> Acc. IEC 60331-1 or IEC 60331-2
Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-353
Choice and Installation
> Acc. to IEC 60092-352

Temperature

Maximum conductor temperature
> +90°C

Pulling force

Maximum per conductor
> 50 N / mm²

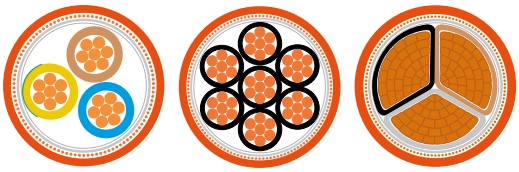
Conductor cross-section mm	Earth wire version	Conductor height mm	Conductor width mm	Cable diamter mm	Cable weight kg/km	Bending radius, fixed mm
POWER CABLES						
2 x 1,5		1,6	–	10,0	115	40
2 x 2,5		2,0	–	11,0	140	45
3 x 1,5	3G1,5	1,6	–	10,5	135	45
3 x 2,5	3G2,5	2,0	–	11,5	170	50
3 x 4		2,6	–	13,5	265	55
3 x 6		3,1	–	15,0	340	60
3 x 10		4,0	–	17,0	500	70
3 x 16		5,0	–	20,0	725	80
3 x 25		5,8	–	23,0	1130	95
3 x 35		6,8	–	25,5	1490	155
3 x 50		6,5	10,7	25,5	1700	205
3 x 70		7,9	12,8	29,5	2360	240
3 x 95		9,3	15,1	33,0	3170	270
3 x 120		10,5	17,0	36,0	3950	290
3 x 150		11,6	18,9	40,0	4840	320
4 x 1,5	4G1,5	1,6	–	11,5	160	45
4 x 2,5	4G2,5	2,0	–	12,5	210	50
4 x 4		2,6	–	15,0	310	60
4 x 6		3,1	–	16,3	420	70
4 x10		4,0	–	19,0	630	80
4 x 16		5,0	–	22,0	930	90
4 x 25		5,8	–	25,5	1430	110
4 x 35		6,8	–	28,5	1910	175
4 x 50		7,2	9,9	29,5	2160	240
4 x 70		8,6	12,0	34,0	3120	275
4 x 120		11,5	15,8	41,5	5210	335
CONTROL CABLES						
5 x 1,5		1,6	–	12,5	200	50
7 x 1,5		1,6	–	14,0	250	60
12 x 1,5		1,6	–	18,0	370	75
19 x 1,5		1,6	–	21,0	550	85
27 x 1,5		1,6	–	26,0	770	160
5 x 2,5		2,0	-	14,0	240	55
7 x 2,5		2,0	–	16,0	330	65
12 x 2,5		2,0	–	20,0	520	80
19 x 2,5		2,0	–	24,0	770	150

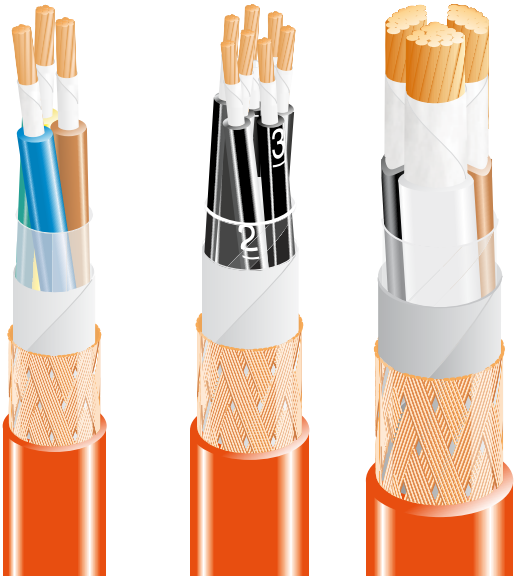
PHFX-AFR

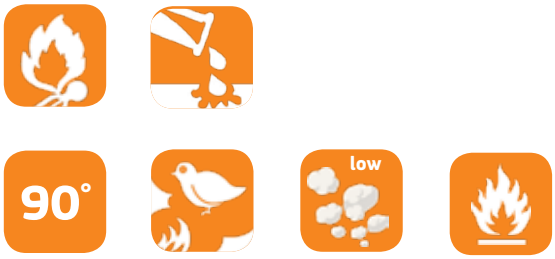
LSM-FRHF

0,6/1 (1,2) kV
ARMOURED, FIRE RESISTANT POWER & CONTROL CABLE

For fixed installation in power, lighting and control circuits on sea vessels and offshore platforms.







Conductor
Annealed stranded plain copper, class 2.
> Round in multicore from 1,5 to 35 mm²
> Sector shaped in multicore from 50 to 185 mm²
> Conductor is compressed when ≥25 mm²

Insulation
Layer of fire resistant mica tape, with overlap
> Extruded HF 90°C
> See page 41 for core identification colours

Armour
Braid of copper wires
> Designed to act as a collective screen

Sheath
Extruded orange halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards
IEC 60092-353 and IEC 60092-350
> Materials
IEC 60228 class 2(conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals
> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> BV (Bureau Veritas)
> RMRS (Russian Maritime Registration of Shipping)

Properties
Fire resistant
> Acc. IEC 60331-1 or IEC 60331-2
Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-353
Choice and Installation
> Acc. to IEC 60092-352

Temperature
Maximum conductor temperature
> +90°C

Pulling force
Maximum per conductor
> 50 N / mm²

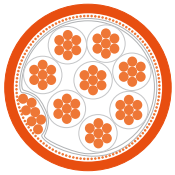
Conductor cross-section mm	Earth wire version	Conductor heigth mm	Conductor width mm	Diameter over braid mm	Cable diameter mm	Cable weight kg/km	Bending radius, fixed mm
POWER CABLES							
2x1,5		1,6	–	8,5	11,0	145	70
2x2,5		2,0	–	9,5	12,0	170	75
3x1,5	3G1,5	1,6	–	9,0	11,5	170	70
3x2,5	3G2,5	2,0	–	10,0	12,5	220	75
3x4		2,6	–	13,5	16,0	430	100
3x6		3,1	–	15,0	18,0	580	110
3x10		4,0	–	17,0	20,0	780	120
3x16		5,0	–	20,0	23,0	1070	140
3x25		5,8	–	25,0	28,5	1630	175
3x35		6,8	–	27,0	30,5	2060	190
3x50		6,5	10,7	27,0	30,5	2250	245
3x70		7,9	12,8	30,5	35,0	3040	280
3x95		9,3	15,1	34,0	39,0	4030	320
3x120		10,5	17,0	37,5	42,5	4920	340
3x150		11,6	18,9	41,0	44,5	5960	360
4x1,5		1,6	–	10,0	12,5	205	75
4x2,5		2,0	–	11,0	13,5	260	85
4x4		2,6	–	15,0	18,0	560	110
4x6		3,1	–	16,5	19,5	690	120
4x10		4,0	–	19,0	22,0	940	135
4x16		5,0	–	22,0	25,0	1290	150
4x25		5,8	–	27,0	31,0	1990	190
4x35		6,8	–	29,5	33,5	2540	200
4x50		7,2	9,9	30,5	35,0	2930	280
4x70		8,6	12,0	35,0	40,0	4010	320
4x120		11,5	15,8	42,5	48,0	6330	385
CONTROL CABLES							
5x1,5	5G1,5	1,6	–	11,0	14,0	250	85
7x1,5		1,6	–	12,0	15,0	320	90
12x1,5		1,6	–	17,0	20,0	570	120
19x1,5		1,6	–	19,5	23,0	800	140
27x1,5		1,6	–	24,0	28,0	1100	170
5x2,5		2,0	–	12,0	15,0	320	90
7x2,5		2,0	–	14,0	16,5	460	100
12x2,5		2,0	–	19,0	22,0	740	130
19x2,5		2,0	–	22,0	26,0	1050	160

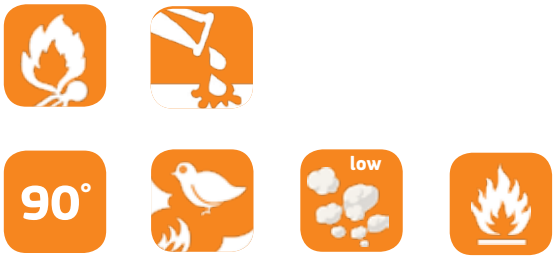
SIENOPYR FR FMHXCH FE 120

FIRE RESISTANT

150/250 (300) V ARMOURED INSTRUMENTATION, CONTROL & COMMUNICATION CABLE

FIre resistant instrumentation, communication and control cable for fixed installation on sea vessels and offshore platforms.





Conductor
Annealed stranded plain copper, class 2.
> Round 0,75 mm²

Insulation
Ceramic HF S95 compound
> White

Pairs
Numbered white cores are twisted to pair
> 2 pair in a quad

Armour
Braid of copper wires

Sheath
Extruded orange halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards
IEC 60092-376
> Materials
IEC 60228 and IEC 60092-376 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals
> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> LR - Lloyds Register
> RMRS (Russian Maritime Registration of Shipping)

Properties
Fire resistant
> Acc. IEC 60331-21 or IEC 60331-31
Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-376

Temperature
Maximum conductor temperature
> +90°C

Pulling force
Maximum per conductor
> 50 N / mm²

Conductor cross-section mm	Conductor diameter mm	Cable diameter mm	Cabel weight kg/km	Bending radius, fixed mm
POWER CABLE				
1 x 2 x 0,75	1,1	8,4	92	55
2 x 2 x 0,75	1,1	9,6	127	60
4 x 2 x 0,75	1,1	12,5	200	75
7 x 2 x 0,75	1,1	14,9	305	90
10 x 2 x 0,75	1,1	18,1	430	110
14 x 2 x 0,75	1,1	20,6	560	125
19 x 2 x 0,75	1,1	22,8	700	140
24 x 2 x 0,75	1,1	25,8	870	155

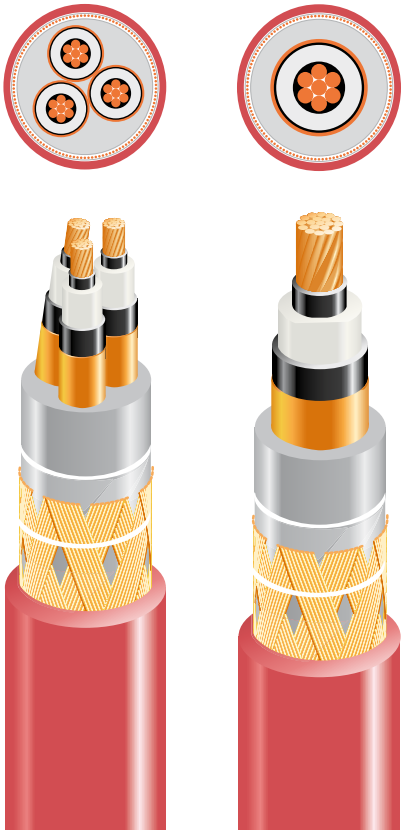
Conductor cross-section mm	Conductor resistance at 20°C ohm/km	Insulation resistance ohm/km	Mutual capacitance nF/km	Loop inductance mH/km
ELECTRICAL DATA				
n x 2 x 0,75	26	480	120	0,7

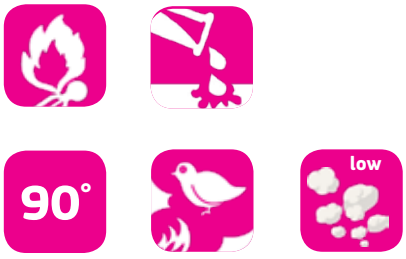
MV-FHFX/A

FLAME RETARDANT

6/10 (12) kV ARMOURED MEDIUM VOLTAGE CABLE

For fixed installation in power circuits with a rated voltage of 6/10 (12) kV on marine vessels and offshore platforms.





Conductor
Fine stranded plain copper, class 5.

Conductor screen
Semi-conductive tape and extruded compound

Insulation
Extruded XLPE nom. thickness 3.4 mm

Insulation screen
Extruded semi-conductive compound

Metallic screen
Copper tape

Inner sheath
Extruded halogen free compound

Armour
Braided of copper wires

Outer sheath
Extruded black halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards
IEC 60092-354 and IEC 60092-350
> Materials
IEC 60228 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals
> ABS (American Bureau of Shipping)
> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> BV (Bureau Veritas)
> LR - Lloyds Register
> RMRS (Russian Maritime Registration of Shipping)

Properties
Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-354
Choice and Installation
> Acc. to IEC 60092-352

Temperature
Maximum conductor temperature
> +90°C

Pulling force
Maximum per conductor
> 50 N / mm²

Conductor cross section mm²	Conductor diameter mm	Core diameter mm	Inner covering thickness mm	Braid diameter mm	Outer diameter mm	Cable weight kg/km
1 x150	15,6	25,0	1,2	29,0	33	2260
3 x 35	7,5	17,0	1,2	41,0	46	3460
3 x 50	8,7	18,5	1,2	44,5	50	4010
3 x 70	10,3	20,0	1,2	47,5	53	4930
3 x 95	12,1	21,5	1,2	51,0	57	6060
3 x 120	13,6	23,0	1,2	54,0	60	7050

Conductor cross section mm²	Current rating at +45°C A	Conductor Resistance R_{DC} W/km			Inductance mH/ km	Capacitance mF/km
		+20°C	+45°C	+85°C		
1 x 150	369	0.124	0.136	0.156	0.318	0.403
3 x 35	104	0.524	0.575	0.658	0.357	0.237
3 x 50	130	0.387	0.425	0.486	0.341	0.264
3 x 70	160	0.268	0.294	0.337	0.321	0.300
3 x 95	194	0.193	0.212	0.242	0.307	0.342
"3 x 120	225	0,153	0.168	0.192	0.296	0.377

1) IEC 60092-352 Table B.4 x 0,95 (see also Tables A.1 - A.8)

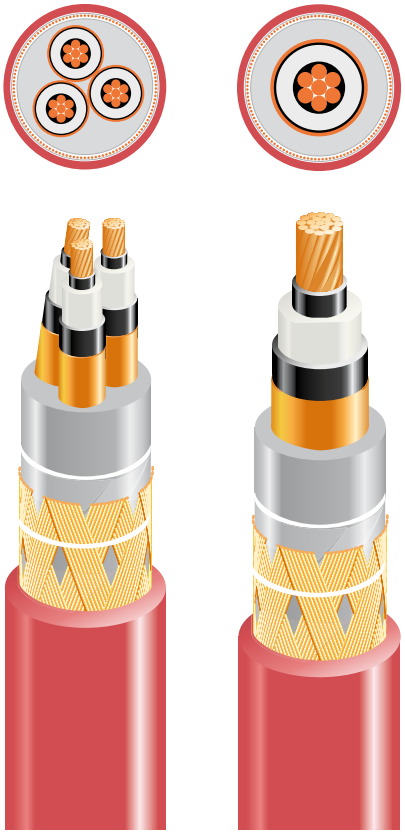
Other sizes available upon request

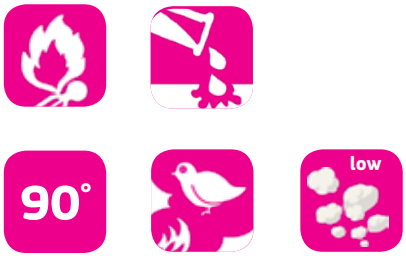
MV-FHFX/A

FLAME RETARDANT

12/20 (24) kV ARMOURED MEDIUM VOLTAGE CABLE

For fixed installation in power circuits with a rated voltage of 12/20 (24) kV on marine vessels and offshore platforms.





Conductor
Fine stranded plain copper, class 5.

Conductor screen
Semi-conductive tape and extruded compound

Insulation
Extruded XLPE nom. thickness 5,5 mm

Insulation screen
Extruded semi-conductive compound

Metallic screen
Copper tape

Inner sheath
Extruded halogen free compound

Armour
Braided of copper wires

Outer sheath
Extruded black halogen free polyolefine, SHF1
> Installation information and electrical data on pages 42-43

Standards
IEC 60092-354 and IEC 60092-350
> Materials
IEC 60228 (conductor)
IEC 60092-360 (insulation)
IEC 60092-360 (sheath)

Approvals
> ABS (American Bureau of Shipping)
> DNV-GL (Det Norske Vertitas - Germanischer Lloyd)
> BV (Bureau Veritas)
> LR - Lloyds Register

Properties
Flame Retardance
> Acc. IEC 60332-3-22 (cat A) and IEC 60332-1-2
Halogen Free
> Acc. to IEC 60754-1 and -2
Low Smoke Emission
> Acc. to IEC 61034-1 and -2
Tests
> Acc. to IEC 60092-354
Choice and Installation
> Acc. to IEC 60092-352

Temperature
Maximum conductor temperature
> +90°C

Pulling force
Maximum per conductor
> 50 N / mm²

Conductor cross section mm²	Conductor diameter mm	Core diameter mm	Inner covering thickness mm	Braid diameter mm	Outer diameter mm	Cable weight kg/km
1 x 150	15,6	29,3	1,2	33,4	38	2670
3 x 35	7,5	21,2	1,2	51,3	58	4780
3 x 50	8,7	22,4	1,2	53,9	60	5450

Conductor cross section mm²	Current rating at +45°C A	Conductor Resistance R_{DC} W/km			Inductance mH/ km	Capacitance mF/km
		+20°C	+45°C	+85°C		
1 x 150	369	0.124	0.136	0.156	0,366	0,273
3 x 35	104	0.524	0.575	0.658	0,395	0,169
3 x 50	130	0.387	0.425	0.486	0,376	0,185

1) IEC 60092-352 Table B.4 x 0,95 (see also Tables A.1 - A.8)

Other sizes available upon request

TECHNICAL INFORMATION

General
The rated voltage of a cable must not be lower than the nominal voltage of the circuit in which it is used. The ambient temperature during operation should be at least 10°C lower than the maximum conductor temperature allowed to the insulation material.

Rated Voltage
The rated voltages of cables are expressed as Uo/U(Um) where:

Uo the rated voltage between the conductor and earth, or between the conductor and the metal screen for which the cable is designed.

U the rated voltage between the conductors for which the cable is designed.

Um the highest system voltage for which the cables may be used

Installation Temperature
The minimum installation temperature for thermoplastic sheathed cables is –15°C. If, however, the cables are warmed up prior to installation, they can be installed at lower temperatures. Lowest operation temperature -40°C.

Earthing of Braids
Earthing of braids is to be carried out in accordance with the regulations of the classification society.

Bending Radius
The minimum bending radii according to IEC 60092-352 in the final fixed assembly:

During installation the recommended radius is 1,5 times the value given in the table. Maximun pulling tension P = 50 N/mm^2 x total conductor cross section mm^2 value of the cable.

Insulation material	Outer covering	Outer cable diamter	Bending radius
Thermoplastic or thermo-setting with circular copper conductors	Unarmoured	≤25 mm	4 x D
	Armoured	>25 mm	6 x D
	Metal braid screened or armoured	Any	6 x D
	Armoured with metal wire, tape or sheath	Any	6 x D
	Composite polyester or metal laminate screened units or collective tape screening	Any	8 x D
Thermoplastic or thermo-setting with shaped copper conductors	Any	Any	8 x D
Medium voltage cables	Any	Singel-core	12 x D
		3-core	9 x D

TECHNICAL INFORMATION

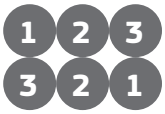
Special precautions for single core cables for a.c. wiring.

Whenever possible, a.c. wiring should be carried out with multicore cables. When it is necessary to use single core cables, they should either be unarmoured or armoured with a non-magnetic material.

When several multi or single core cables are connected in parallel per phase, they should be of the same type and equal length.

All cables pertaining to the same phase should be alternated with those of the other phases to avoid unequal division of the current. In the case of two cables per phase, for example, the correct dispositions to conform with IEC 60092-352 (phases 1, 2 and 3) are:

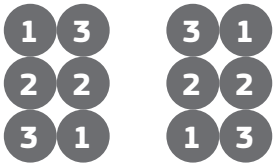
Or



Or

Some other installation examples of single core cables (phases 1, 2 and 3).

Four cables per phase

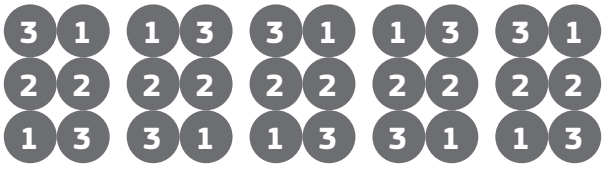


Or

Six cables per phase

Or

Ten cables per phase on the same cable tray



Prysmian Group

CURRENT RATING

Current rating for continuous service. Conductor temperature max. +90˚C, ambient max +45˚C. According to IEC 60092-352, Table B.4 for 0,6/1 kV cables. Up to 6 cables bunched together.

	Cores	1	2	3	4	5	7	12	19	27	37
	Reduction	1,00	0,85	0,70	0,70	0,58	0,52	0,44	0,37	0,33	0,30
Cross-section	($мм^2$)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
	1,5	23	20	16	16	13	12	10	9	8	7
	2,5	30	26	21	21	18	16	13	11	10	9
	4	41	34	28	28	24					
	6	52	44	36	36	30					
	10	72	61	50	50	42					
	16	96	82	67	67	56					
	25	127	108	89	89	74					
	35	157	133	110	110	92					
	50	196	167	137	137						
	70	242	206	169	169						
	95	293	249	205	205						
	120	339	288	237	237						
	150	389	331	272	272						
	185	444	377	311	311						
	240	522	444	365	365						
	300	601	511	421	421						

Ambient temperature correction factors According to IEC 60092-352									
Temperature (˚C)	35	40	45	50	55	60	65	70	75
Correction factor	1,10	1,05	1,00	0,94	0,88	0,82	0,74	0,67	0,58

IDENTIFICATION COLOURS

POWER & CONTROL CABLE CORES

Cables withour earth cores

Type	Neutral (N)		Line	
2×	Blue	Brown		
3×		Brown	Black	Grey
4×	Blue	Brown	Black	Grey
5x - 37×	White or black insluation with numbers			

Cables with earth cores

Type	Earth (PE)	Neutral (N)		Line	
3G	Green - yellow	Blue	Brown		
4G	Green - yellow		Brown	Black	Grey
5G	Green - yellow	Blue	Brown	Black	Grey
7G - 37G	White or black insluation with numbers + last core green-yellow				

CONTROL & INSTRUMENTATION CABLE CORES

Pair	Core a White insulation + black numbers	Core b Blue insulation + black numbers
1	1	2
2	3	4
N	2 * N - 1	2 * N

Prysmian Group

ELECTRICAL DATA

Cable type TEMAR PHFX -U, -A, -UFR, -AFR (n x mm²)	Cross-section (mm²)	Conductor Resistance acc. to IEC 60228 class 2. R (Ω/км)			Inductance L (мн/км)
		at +20˚C	at +45˚C	at +85˚C	
1×35	35	0,524	0,575	0,658	0,316
1×50	50	0,387	0,425	0,486	0,315
1×70	70	0,268	0,294	0,336	0,303
1×95	95	0,193	0,212	0,242	0,292
1×120	120	0,153	0,168	0,192	0,284
1×150	150	0,124	0,136	0,156	0,286
1×185	185	0,0991	0,109	0,124	0,281
1×240	240	0,0754	0,083	0,095	0,276
1×300	300	0,0601	0,066	0,075	0,288
2×1,5	1,5	12,1	13,289	15,191	0,336
2×2,5	2,5	7,41	8,138	9,303	0,313
3×1,5	1,5	12,1	13,289	15,191	0,336
3×2,5	2,5	7,41	8,138	9,303	0,313
3×4	4	4,61	5,063	5,788	0,293
3×6	6	3,08	3,383	3,867	0,281
3×10	10	1,83	2,010	2,297	0,266
3×16	16	1,15	1,263	1,444	0,254
3×25	25	0,727	0,798	0,913	0,211
3×35	35	0,524	0,575	0,658	0,202
3×50	50	0,387	0,425	0,486	0,200
3×70	70	0,268	0,294	0,336	0,197
3×95	95	0,193	0,212	0,242	0,190
3×120	120	0,153	0,168	0,192	0,189
3×150	150	0,124	0,136	0,156	0,191
3×185	185	0,0991	0,109	0,124	0,193
3×240	240	0,0754	0,083	0,095	0,190
3×300	300	0,0601	0,066	0,075	0,188
4×1,5	1,5	12,1	13,289	15,191	0,359
4×2,5	2,5	7,410	8,138	9,303	0,336
4×4	4	4,61	5,063	5,788	0,317
4×6	6	3,08	3,383	3,867	0,304
4×10	10	1,83	2,010	2,297	0,289
4×16	16	1,15	1,263	1,444	0,278
4×25	25	0,727	0,798	0,913	0,267
4×35	35	0,524	0,575	0,658	0,258
4×50	50	0,387	0,425	0,486	0,217
4×70	70	0,268	0,294	0,336	0,213
4×95	95	0,193	0,212	0,242	0,206
4×120	120	0,153	0,168	0,192	0,205
4×150	150	0,124	0,136	0,156	0,209
4×185	185	0,0991	0,109	0,124	0,209
4×240	240	0,0754	0,083	0,095	0,206
4×300	300	0,0601	0,066	0,075	0,204

ELECTRICAL DATA

Cable type TEMAR PHFX -U, -A, -UFR, -AFR (n x mm²)	Reactance		Voltage Drop at +85°C - cos = 0,8 (mV/Am)				
	at 50 Hz	at 60 Hz	DC	1-phase 50 Hz	3-phase 50 Hz	1-phase 60 Hz	3-phase 60 Hz
1 x 35	0,099	0,119	1,316	1,172	1,015	1,195	1,035
1 x 50	0,099	0,119	0,972	0,896	0,776	0,920	0,796
1 x 70	0,095	0,114	0,673	0,653	0,565	0,675	0,585
1 x 95	0,092	0,110	0,485	0,498	0,431	0,520	0,450
1 x 120	0,089	0,107	0,384	0,415	0,359	0,436	0,378
1 x 150	0,090	0,108	0,311	0,357	0,309	0,379	0,328
1 x 185	0,088	0,106	0,249	0,305	0,264	0,326	0,282
1 x 240	0,087	0,104	0,189	0,255	0,221	0,276	0,239
1 x 300	0,090	0,108	0,151	0,229	0,198	0,251	0,217
2 x 1,5	0,106	0,127	30,382	24,432	21,159	24,458	21,181
2 x 2,5	0,098	0,118	18,606	15,003	12,993	15,026	13,013
3 x 1,5	0,106	0,127	30,382	24,432	21,159	24,458	21,181
3 x 2,5	0,098	0,118	18,606	15,003	12,993	15,026	13,013
3 x 4	0,092	0,111	11,575	9,371	8,115	9,393	8,135
3 x 6	0,088	0,106	7,734	6,293	5,450	6,314	5,468
3 x 10	0,083	0,100	4,595	3,776	3,270	3,796	3,288
3 x 16	0,080	0,096	2,888	2,406	2,084	2,425	2,100
3 x 25	0,066	0,080	1,825	1,540	1,334	1,556	1,347
3 x 35	0,064	0,076	1,316	1,129	0,978	1,144	0,991
3 x 50	0,063	0,075	0,972	0,853	0,738	0,868	0,751
3 x 70	0,062	0,074	0,673	0,612	0,530	0,627	0,543
3 x 95	0,060	0,072	0,485	0,459	0,398	0,474	0,410
3 x 120	0,059	0,071	0,384	0,379	0,328	0,393	0,340
3 x 150	0,060	0,072	0,311	0,321	0,278	0,335	0,291
3 x 185	0,061	0,073	0,249	0,272	0,235	0,286	0,248
3 x 240	0,060	0,072	0,189	0,223	0,193	0,237	0,206
3 x 300	0,059	0,071	0,151	0,192	0,166	0,206	0,178
4 x 1,5	0,113	0,136	30,382	24,441	21,167	24,468	21,190
4 x 2,5	0,106	0,127	18,606	15,011	13,000	15,037	13,022
4 x 4	0,099	0,119	11,575	9,380	8,123	9,403	8,144
4 x 6	0,096	0,115	7,734	6,302	5,457	6,324	5,477
4 x 10	0,091	0,109	4,595	3,785	3,278	3,807	3,297
4 x 16	0,087	0,105	2,888	2,415	2,091	2,436	2,109
4 x 25	0,084	0,101	1,825	1,561	1,352	1,581	1,369
4 x 35	0,081	0,097	1,316	1,150	0,996	1,169	1,013
4 x 50	0,068	0,082	0,972	0,859	0,744	0,875	0,758
4 x 70	0,067	0,080	0,673	0,619	0,536	0,635	0,550
4 x 95	0,065	0,078	0,485	0,465	0,403	0,481	0,417
4 x 120	0,064	0,077	0,384	0,385	0,333	0,400	0,346
4 x 150	0,066	0,079	0,311	0,328	0,284	0,343	0,297
4 x 185	0,066	0,079	0,249	0,278	0,241	0,294	0,254
4 x 240	0,065	0,078	0,189	0,229	0,198	0,245	0,212
4 x 300	0,064	0,077	0,151	0,198	0,171	0,213	0,184

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